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CHILDREN'S TELEVISION WORKSHOP EXPLORES THE WORLD

CONTACT[®]

M. Shirran

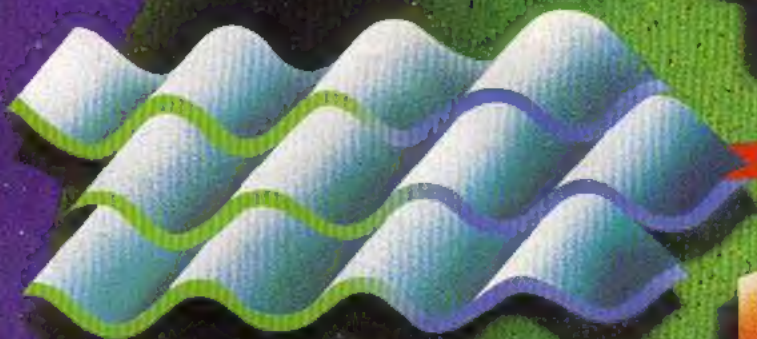
SPECIAL ISSUE

APRIL 1991

SAVE OUR AIR



SAVE OUR WATER



SAVE OUR LAND



SAVE OUR LIVING THINGS



Save
Our
Planet

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PHOTO: MICHAEL McDONOUGH

IN THE DOGHOUSE

Make no bones about it, this house is for the dogs! Last August, the Cooper-Hewitt Museum in New York City had a very special open house. To celebrate the 35th anniversary of a school that trains seeing-eye dogs, the museum asked architects and artists to design the perfect doghouse.

Of the 24 pooch palaces on display, this one really made them howl. It's designed to look like an ancient Mayan temple from Central America. And what dog wouldn't want to visit here?

This bow-wow house is made entirely of dog biscuits. What a way to raise the woof!

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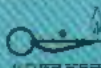
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Award Winner, Feature Category

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ON OUR COVER

Symbols of the environment.
Designed by Al Nagy, illustrated by
Ned Shaw.



Feeling the Heat?

Don't get rid of that winter coat just yet. There's now evidence that the Earth might not be getting warmer, after all.

Dr. Sherwood Idso, a scientist who studies the environment, claims that the Earth's temperature has actually dropped! After studying temperatures recorded at weather stations across the U.S., Dr. Idso says the average change in temperature over the last 70 years was a one-third degree *decrease*.

Other scientists, though, say temperatures haven't chilled out. Their research shows that



Nose Job

For years, scientists have been up in arms about body odor. No one was sure what was causing it. But it now seems that nobody will be sweating over the problem anymore. That's because a team of scientists recently identified the chemical that causes underarm odor. The discovery is expected to help the deodorant industry make better and longer-lasting products.

The odor has been traced to glands in the armpit. These glands produce a small amount of fluids, or secretions, each day.

But it's not the secretions that smell—they're odorless. The odor is caused by billions of harmless bacteria that live on everyone's skin. When the bacteria eat the secretions, they produce a chemical that smells bad.

How did the scientists make the discovery? They set up a "body shop," where six males volunteered not to use deodorant or soap for a week before the study began! (Men are "smellier" because they have more glands than women do.) For the next two weeks, the volunteers wore cotton pads in their armpits.

The researchers then used special equipment to separate hundreds of chemicals from each pad. The scientists sniffed each chemical until they were on the right scent. Now that's what you call following your nose!

the Earth has already warmed up one degree in the last 100 years. But Dr. Idso says these measurements were taken in big cities where temperatures are higher. "Urban heat islands form when more people settle in an area," he explains. "People burn fires, drive cars and pave over land that used to reflect more heat and evaporate more water."

So is the world heating up or cooling down? We won't know until more research is done. But one thing is certain—it's going to stay a hot topic for awhile.

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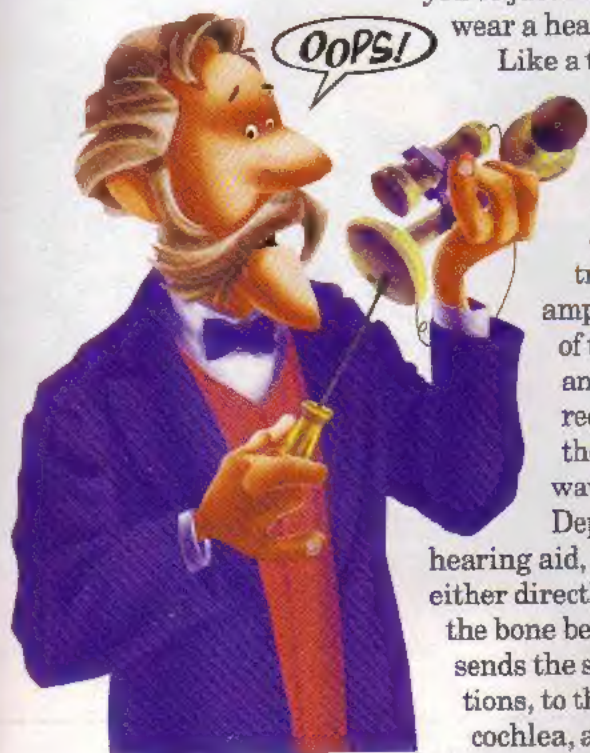
ANY QUESTIONS?

By Jeannette Sanderson

**H
O
W**

DOES A HEARING AID WORK?

If you can imagine having a miniature telephone stuck to your ear, you've just imagined what it's like to wear a hearing aid.



Like a telephone, a hearing aid has a microphone, an amplifier and a receiver. The microphone receives sound waves and changes them into electrical impulses. The amplifier increases the size of these electrical impulses and sends them to the receiver, which changes them back into sound waves.

Depending on the type of hearing aid, the sound waves are sent either directly to the inner ear or to the bone behind the ear. (The bone sends the sound waves, or vibrations, to the inner ear.) Then the cochlea, a spiral tube inside the inner ear, changes the sound waves into electrical signals. These signals travel to the brain, and sound is heard.

One of the first persons to try to invent a hearing aid ended up inventing the telephone instead. Who was it? Alexander Graham Bell.

Question sent in by Jessica Rogers, Brooklyn, NY



**H
O
W**

CAN THE SUN BURN IN SPACE WHEN THERE IS NO OXYGEN?

The sun doesn't burn as most things we know burn. In fact, ordinary fuel combined with oxygen could never create the sun's intense heat. Then what makes the sun "burn"? Nuclear power.

Nuclear fusion is the process that powers the sun. Here's how it works: The sun is about three-quarters hydrogen. Hydrogen is a colorless gas that is lighter than air. Hydrogen atoms become extremely hot at the center of the sun. Then they combine, or fuse, to form a different kind of atom: helium. When this happens, energy is released in the form of heat and light.

Nuclear fusion will happen in the sun — and many other stars — until it runs out of hydrogen. But don't worry, that won't be anytime soon. Our sun has been "burning up" for over five billion years, and can continue for at least five billion more.

Question sent in by Debbie Overzet, Wisconsin Rapids, WI

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BURIED TREASURE?

Dear CONTACT,
In your December 1990 story, "Chunnel Vision," you said the giant Tunnel Boring Machines (TBM's) will be buried underneath the English Channel when the project is completed.

Why waste millions of pounds of metal like that? Why not take them back up to the surface and make them into cars or something else?

*Kandice Masad
Laguna Beach, CA*

Not all the giant machines are being ditched under the channel. Only the very biggest ones. The Chunnel's builders would like to save all the TBM's, but it would be too difficult and too expensive to do it. The TBM's automatically paved the sides of the Chunnel as they dug, making the tunnels a few feet narrower than the TBM's themselves. Now that they are stuck in the center, it would cost a lot of money, use up more fuel and require the building of many new machines to get the TBM's out.

FUNNY OR PHONEY?

Dear CONTACT,
In your "America's Phoniest Math Videos" comic (January/February 1991), the announcer, Bob Slagpit, called the show "America's Funniest Math Videos." Was that a mistake? Which is the real name of the comic?

*Barb Hendershot
Concord, CA*

Whoops! You're right, Barb. The title was supposed to be "America's Phoniest Math Videos." Bob Slagpit seems to have made a little error himself. Maybe he should be a host on MTV, instead. It has a shorter title.

READING BETWEEN THE LINES

Dear CONTACT,
Thanks for your article on "Label Fables" (November 1990). You really included all the details of why and how to read the facts. From now on, I'm going to look more closely at food labels!

*Kristina Taylor
Rockville, MD*

Good for you, Kristina! We ran that story to help kids sort out the truth among all the confusing gobbledegook that's out there. We'd like all of our readers to be healthier eaters and smarter shoppers!

YOU'VE GOT OUR NUMBER!

Dear CONTACT,
In Puzzle #3 of Brain Teasers (October 1990), you asked for five odd numbers that add up to 14. Your answer was $11 + 1 + 1 + 1$. Isn't that only four numbers?

*Devin Jessup
Santa Maria, CA*

Sorry Devin. We should have asked for five digits. That way, 11 counts as two numbers. We hope this clears things up so you can share this brain teaser with your friends.

WE WANT MAIL!

Dear Readers:

We love hearing from you. Your questions and ideas help us make CONTACT a better magazine. So why not drop us a line? We can't answer every letter, but we do read them all. Send your mail to:

3-2-1 CONTACT: Letters
P.O. Box 40
Vernon, NJ 07462





Save Our Planet

Mother Earth is hurting. Pollution threatens the air we breathe, the water we drink, the land we live on. The list of endangered animals grows longer each day. Things look bad.

But this special section of **CONTACT** will give you hope. Because adults and young people—like you—are fighting hard for our planet's future. The section is in honor of Earth Day, which is celebrated on April 22.

On the following pages, you'll discover how people and governments are working to save the environment. How rivers are being cleaned, trash is being recycled and air is being scrubbed. And how new, clean sources of energy are being developed.

This section offers a challenge. It says: "Here are the problems. Now let's think of solutions." And the sooner we think of them, the better. Because Mother Earth can't wait forever.



It's all around us. It's something we take for granted. But we couldn't live without it. What is it? Air. But there is one thing we *could* live without. And that's air pollution.

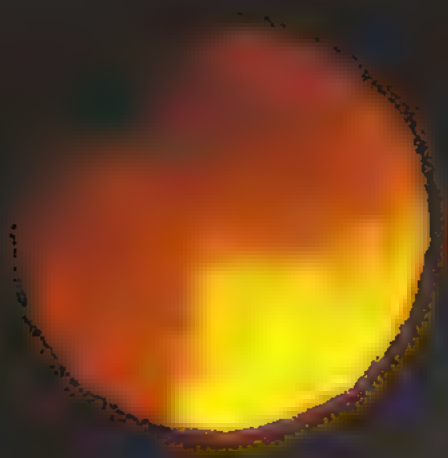
Each year, factories, trucks and cars throw five billion tons of poisonous gases into Earth's atmosphere. Scientists warn that these gases could turn our planet into a giant hothouse. When gases, like carbon dioxide, are released into the air, they stay there. And like a greenhouse, they let the sun's rays through, but block extra heat from escaping. These gases may cause the world's temperatures to rise—by as much as eight degrees in 50 years.

What would life be like if that happens? Some experts predict that the hotter climate will dry up many agricultural regions. At the same time, the higher temperatures may melt some polar ice, causing the oceans to rise. "By 2050, the oceans could be as much as four feet higher," says Rafe Pomerance. He is an environmental expert at the World Resources Institute. "This would threaten the homes of millions of people living in coastal areas."

Acid rain poses a different threat. Cars, trucks and coal-burning power plants cough up chemicals into the air. When these chemicals mix with water vapor, they form acids that eventually fall back to the ground in the form of "acid rain."

When foam plastic products, such as egg cartons, are burned, as many as 57 different chemicals are released into the air.

Up In Smoke



Acid rain has made some lakes and streams highly poisonous, destroying the fish populations. It also eats away buildings and monuments and has damaged forests.

"These pollutants know no borders," Pomerance told CONTACT. "Winds can carry the gases hundreds of miles from their source. For example, nearly half the acid rain falling on Canada comes from the U.S."

In 1985, scientists discovered another big problem. They found a hole the size of the U.S. in the ozone layer above Antarctica. The layer is a paper-thin sheet of invisible gas that surrounds the planet and filters out harmful rays of the sun. Since 1985 the hole has gotten bigger.

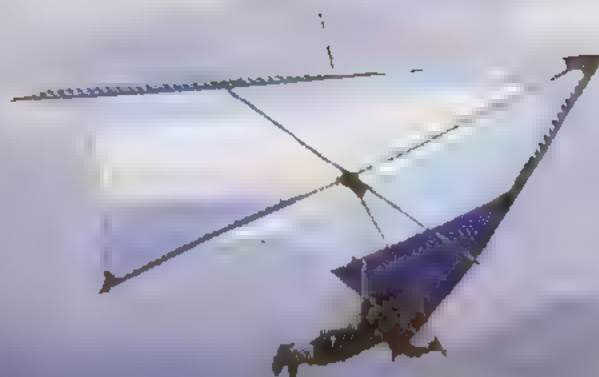
The problem may seem far away, but it's as close as the plastic egg carton in your refrigerator or the air conditioner in your window. That's because both release odorless gases, called CFC's, into the atmosphere.

Under the right conditions, CFC's destroy the ozone layer. "When CFC's destroy ozone," EPA specialist Dan Blank explains, "more ultraviolet (UV) radiation reaches the Earth. UV radiation causes skin cancer and harms crops. It also destroys plankton that float near the ocean's surface and form an important part of the marine food chain."

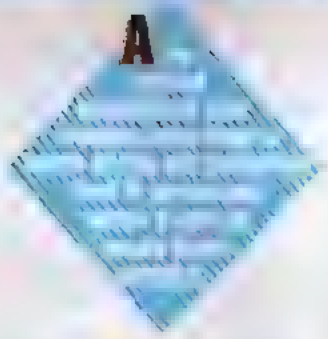
And that's the bad news. But the good news is that the world is beginning to fight air pollution. Flip the page to check out some air pollution solutions.



Clearing The Air



A



When 81 American cities failed to meet U.S. government rules for clean air in 1989, government officials decided to take the law into their hands. Last October, Congress changed the laws to clean up the 20-year-old Clean Air Act—and our air.

And the rules have changed. For example: Factories will have to cut in half the amount of chemicals that can be poured into the atmosphere. Oil companies must make new kinds of gasoline that burn more cleanly. And many plants will have to wash coal before burning it or install smokestack "scrubbers" to get rid of pollutants. "The air is going to be a lot cleaner 10 years from now," says Dan Weiss, who works for the Sierra Club.

But it's not just the U.S. that's cleaning up its act. Last summer, 61 countries promised to stop all production of CFC's by the year 2000. And 22 nations have agreed to reduce the amount of pollutants that cause acid rain. "Since the problems that threaten the Earth are global, they must be attacked globally," explains Dr. Berrien Moore, an environmental expert. "We're all in this together."

A group of kids in Freeport, ME, would agree. Last year, they worked together to convince their town council to ban polystyrene products. Polystyrene is a type of foam plastic that can be found in egg cartons and drinking cups. Many fast-food restaurants use it to package their burgers. (Some restaurants—like McDonald's—have stopped using plastic packaging because it's bad for the environment.)

What's bad about these packaging materials? "Polystyrene materials don't biodegrade," student activist Kristen Nunery told CONTACT. "When they're burned, they pollute the air and make acid rain."

Kristen and other members of the group called C.A.K.E. (Concerns About Kids' Environment) collected 300 signatures for a petition to ban the materials in their town. And their message was clearly heard. The town council voted to stop the sale of all polystyrene containers. "A lot of people think kids can't do very much to change the world," says C.A.K.E. member Anna Brown. "But I think kids might be our only chance."

YOU CAN HELP

- Use cars less. Ride a bike, walk or use buses or trains whenever you can. You might even help build bike trails in your area.
- Plant a tree or a shrub. Each plant, in its own small way, helps clear the air.
- Turn off lights when they're not in use. This will save energy as well as save our air. (It takes about 394 pounds of coal to keep one 100-watt light bulb on for 12 hours.)
- Remind your parents to use only unleaded gas. Leaded gas pollutes the air more, and it ruins a car's pollution controls.
- Use fans instead of air conditioners to cool your home on hot days. If you do use an air conditioner, don't set the temperature lower than 78 degrees Fahrenheit.



Troubled Waters

Earth's waters are in trouble. Sometimes by accident, and sometimes on purpose. Humans poison their rivers, lakes and oceans. Huge oil spills often happen. In 1989, the tanker *Exxon Valdez* spilled 11 million gallons of oil off the Alaskan coastline. People organized a huge cleanup to try to limit the damage to animals in those waters and along the shore. But day after day, many types of water pollution go unnoticed.

Other chemicals used on farms often seep into the ground water. Or else they get washed into rivers and are carried out to sea. Some factories and

oil refineries also dump their wastes into rivers and seas. Many cities around the world dump their raw sewage directly into the water. All of these make bodies of water dangerous to swim in, unsafe to drink and deadly to marine life.

It's easy to see the results of oil spills, which can kill fish and birds. Garbage dumping, which washes ashore and closes down beaches, is also obvious. But many other water problems are harder to track down. Scientists say that they cannot explain the pollution on marine animals' long lives. They are sure, however, that it is actually causing the problem. In 1988, one-fifth of the North Sea seal population died. It took many months for scientists to decide that

the deaths were caused by the dumping of garbage and sewage into the ocean. More recently, hundreds of dead and injured dolphins washed ashore in France, Italy and the U.S. Again, scientists think pollution is to blame.

"Pollution can cause algae blooms, or 'red tides' around the world," says Dr. Benion Moore of the Institute for the Study of Earth, Ocean and Space. "Algae growing feed off the fertilizers and sewage that empty into the ocean. As the plants multiply, they suck oxygen from the water. This creates huge dead zones in the ocean, which threaten marine life."

Meanwhile, our freshwater supply—lakes and rivers—is being



Save Our Waters



Students at Bellingham
Cooperative School
rescue a local stream.

It's not just me! People have been using more and more resources (the government) to protect rivers, streams, and the results are starting to show. The use of many harmful chemicals has been outlawed. This has reduced levels of many toxic pollutants in our water. The U.S. Congress has already passed laws that will forbid from sewage dumping by 1992. And last year, President Bush approved a bill that limits the amount of chemicals we can take place close to American shores.

But it isn't just up to the government to save our waters. More and more people are beginning to take the job of cleaning our lakes and streams into their own hands.

The students at Bellingham Cooperative School in Bellingham, WA, showed that even one group of kids can make a difference. Five years ago, a nearby stream was full of oil and garbage. All the fish and plants that once lived there had died. The stream "adopted" the creek. With the help of their school and community, they cleaned up all the litter and planted fresh plant life along the edges of the stream.

Then, the Washington State Department of Ecology gave 1,000 rubber ducks to the project. The kids placed the ducks in their school aquarium. Every morning, they released the fish back into the stream. According to Jerome Edwards, one of the students, "I don't know if I know if I'm doing something to help the environment."

This is only one of hundreds of water-saving stories. Join in the cleanup and you too can make a difference!

YOU CAN HELP

- Take shorter showers. Switching from a 10-minute shower to a two-minute shower can save 100 gallons of water every day.
- Keep a pitcher of water in your refrigerator, instead of letting your faucet run each time you need a drink of cold water.
- When you water your lawn, only spray water where the grass is. Sweep the sidewalk and the street with a broom, instead of using your hose to wash away dirt.
- Don't leave the water running while brushing your teeth.
- Get involved! Organize cleanup teams and pollution patrols in your own neighborhood.

8 Seven thousand gallons of water can be saved by recycling one ton of paper.



TOO MANY PEOPLE.

Every day, Americans throw out enough garbage to fill up 63,000 garbage trucks. If you lined them up head and tail, they'd stretch from San Francisco to Los Angeles—a distance of about 370 miles. That's a lot of garbage! Now, if you multiply the amount of trash we throw out daily by the number of days in the year... well, you get the picture.

Dr. Jan Beyes of the National Audubon Society sums it up this way: "Our throw-away society has created a huge mess."

Until recently, nobody gave the trash much thought. It was collected and whisked away to a dump site. Today, however, dump sites are being closed. And fewer people are willing to have new dumps in their communities.

"No one wants incinerators that burn garbage or garbage dumps in their backyards," notes Dr. Beyes. "When garbage is burned, it releases dangerous gases into the air. Dumped

garbage and industrial waste can become deadly when acids, metals and other materials leak out of landfills." Americans are now realizing that the garbage just won't disappear and the problem can't be ignored. So, where will all this garbage go? The question, Dr. Beyes says, is where did it come from? "Instead of trying to get rid of mountains of trash, we should try to reduce the size of the mountains. Even though recycling is the best way to reduce trash, only

TOO

MUCH

GARBAGE

10 percent of American garbage is recycled each year.

Garbage isn't the only problem that affects our land. In many places, people have destroyed it, making it useless for anything. "More than 14 million acres of new desert are formed each year, mostly in America," says Dr. William Moore. He is the director of the Institute for the Study of Earth, Oceans and Space. In many countries, poor farming practices have turned agricultural areas into wasteland. In the African nation of Mali, for instance, people begin each day by shoveling mounds of sand away from their doors.

Dr. Moore says the problem is caused by overpopulation. Seven billion people are threatening the Earth's health and survival. Today, our planet holds more than 5 billion people. By the next century, the world population will double.

In the poorest countries, the population is growing faster than the amount of food, water, fuel and

food. So trees are being chopped down for fuel, and farmers are overusing their lands in a struggle to survive. If nothing changes, that means environmental disaster," notes Dr. Moore.

Almost everyone agrees that the problems facing our lands—too much garbage, too many people, poor farming practices—can be solved for a bright future. But there is hope. To find out what the world's governments and scientists are doing to help get us out of this mess, turn the page.



They raised money to buy a new piece of equipment for the school. And they learned a lot about the environment. They also learned that they could make a difference.

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The kids also learned a lot about the environment. They also learned that they could make a difference. They also learned that they could make a difference.

HOW YOU CAN HELP

- Don't buy products wrapped in plastic wrapping. They may look pretty, but that also starts a lot of more garbage.
- Recycle glass, aluminum, newspaper and plastic. Call your local solid waste office to find nearby recycling centers.
- Talk to your teachers about starting a school-wide bottle, can and newspaper collection program. It's a good way to raise money for your school.
- Ask your parents to use grass clippings and leaves as mulch. Try to avoid using chemicals in the garden.
- Use less paper. When writing, use both sides of a sheet before throwing it away.

Cleaning Up the Land



If all the people in the U.S. recycled their newspapers, 500,000 fewer trees would have to be cut down every year.

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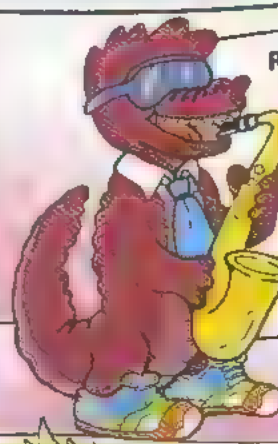
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WANTED:

Some of the World's Most Endangered Treasures

By Russell Ginns

This is a different kind of wanted poster. We don't want to capture any of these things—we want to see them survive. They are some of Earth's treasures. They could disappear completely—if humans don't clean up their act. Enjoy them now, and join the struggle to keep them around forever.



Last Seen: 50 miles off the northeastern coast of Australia.

Warning: This coral reef is home to millions of sponges, sea urchins and fish. But in the last 10 years, large numbers of crown of thorns starfish have been crowding out other sea life and eating the tiny animals that build the coral. Humans have harvested too many of the fish that would normally eat the starfish. So these thorny creatures are growing out of control, causing tremendous damage to the reef. Unless scientists can figure out how to control the starfish, this unique sea community could be wiped out.



Last Seen: Flapping through the rainforest of Papua New Guinea—an island nation in the Pacific Ocean.

Warning: Butterflies and moths from exotic parts of the world are of great interest to bug collectors everywhere. The larger and rarer the insects, the more money collectors are willing to pay for them. A single birdwing butterfly can sell for hundreds of dollars. This encourages even more people to hunt for them, and can drive many species, such as the birdwing, to extinction.

KALAHARI BUSHMEN



Last Seen: On the desert plains of central Africa.

Warning: People are endangered, too! As modern cities and civilizations spread to every corner of the planet, many human societies will vanish. The Kalahari have hunted in the African savanna for centuries. But modern humans are now crowding in on their hunting grounds, forcing them to give up many of their traditional ways. They are in danger of losing their traditions, religions and their way of life.

PHOTO: ADAM HARRIS/GETTY IMAGES

THE PYRAMIDS



Last Seen: Along the Nile River and in several Egyptian cities.

Warning: The rulers of ancient Egypt built these giant structures to last forever. And for about 4,000 years they have stood, unaffected by time. In the last 60 years, however, pollution from nearby cities, such as Cairo, has begun to crumble many of these fantastic monuments. If people don't learn to prevent acid rain and smog, these wonders of the world may be worn away.

PHOTO: MARK HARRIS/GETTY IMAGES

PANDAS



Last Seen: In isolated mountain forests of China.

Warning: No one is hunting these peaceful furry creatures. In fact, most people want to help them to survive. But, pandas don't really need people to love them. They just need space.

Until about 500 years ago, pandas roamed across most of southern China. Today, the area that pandas can live in has shrunk to less than 20,000 miles. There are now fewer than 1,000 pandas left in the wild.

PHOTO: PETER D'AMICO/REUTERS

SYDNEY, AUSTRALIA



Last Seen: Looking out over the Pacific Ocean.

Warning: Because of the greenhouse effect, Sydney and hundreds of other coastal cities are in danger of being washed out. This doesn't mean that tons of water will come crashing down on anyone. But, over the next hundred years, rising ocean levels could creep forward, taking away some of the world's great monuments and architecture.

PHOTO: PETER D'AMICO/REUTERS

One day we may run out of oil.
Then what will we use for energy?
Here is a look at four possible
sources of energy that are clean
and unlimited in supply.

By Jeannette Sanderson

WATER POWER

Hydropower is a way of producing electricity from the force of falling water. Today, in the U.S., there are more than 2,000 hydroelectric plants. They produce enough energy to power about 50 million households. These plants sometimes harm wildlife and ruin scenery. But if those problems could be overcome and more plants were to be built, hydroelectricity could one day light up another 50 million homes.

The power of Earth's oceans may also help light up our homes and power factories. Scientists are just discovering how to tap into ocean energy. One way is by using the power of the tides. Tidal energy works much the same way hydropower does. Incoming water and outgoing water flow through huge machines called turbines. The power of the tides flowing through the turning turbines makes electricity.

Ocean wave power is another source of energy that is being explored. Engineers have built a wave-power plant off the coast of Scotland. The waves produce a flow of air that makes the turbines run. If the plant is successful, it will supply homes in nearby villages with electricity. So who knows? In the future, waves may power your home.

TEAM POWER

Hot springs and geysers like Old Faithful in Wyoming are fascinating to watch. But they are more than just awesome sights. They are also a source of energy. Geothermal (the word means "heat from the Earth") energy springs from heat trapped in rocks and fluids beneath Earth's crust.

Geothermal energy can be used in two ways. Pipes can send its heat, in the form of steam or hot water, directly where it is needed. This is especially popular in Iceland, where more than half the population warms their homes with geothermal heat. Natural geothermal steam can also drive turbines to produce electricity. Geothermal plants in the U.S. produce enough electricity for three million households.

In some ways, geothermal energy may be more important than energy produced by wind, sun, or water. It has 24-hour energy potential, and doesn't get often thousands of miles away from places that need its energy. But there's one problem: the heat from the Earth's interior is not always where we need it. It is often in the ground, and we need to get it out.

PHOTO: JEFFREY M. HARRIS/ISTOCK

SUN POWER

"Solar energy will one day pay for itself in less than a year today," Christopher Flavin of the Woodwell Institute told **CONTACT**. This makes sense, because the sun will hot forever (well, a few billion years). And its power produces no pollution. Two of the most promising forms of solar energy are solar thermal power and photovoltaic (say foe-toe-voe-TAY-ick) cells.

Solar thermal power plants use mirrors to focus the sun's energy. The mirrors, like the ones pictured here near San Diego, CA, are solar collectors. They concentrate sunlight in a receiver. The receiver heats a liquid, which drives a turbine to make electricity. The largest solar power plant in the world is in California's Mojave Desert. It uses more than 600,000 mirrors spread over about 1,600 acres to produce enough power for 275,000 people.

Photovoltaic cells turn sunlight directly into electricity. Large panels of fused metal and silicon cells power homes, offices, electric fences and billboards. Small strips of cells power calculators, watches and even life preservers on a beach. Although solar cells are still too costly used to provide electricity, they have a bright future. According to The Solar Energy Research Institute, photovoltaic cells will supply more than half of U.S. electricity by the year 2040!

PHOTO: A. C. TRIMBLE/GETTY IMAGES

WIND POWER

Hurricanes, Tornadoes, Typhoons. Wind is often a force of great destruction. But when it blows, it can also be a helpful force.

For many years, people have used windmills to pump water. The advent of electricity supply made it possible to pump water and power other devices. Windmills, called wind turbines, were developed that produce electricity. Wind turbines are becoming necessary. The U.S. alone consumes 30 billion kilowatts of electricity each year. It takes about one million homes.

Large groups of wind turbines are called wind farms. The first wind farm was built in 1981 in California. It was called the Santa Ana Wind Farm. It was the first wind farm to produce electricity. The U.S. has many areas in the U.S. that could also support wind farms. The U.S. has the world's largest wind energy potential. The U.S. has the world's largest wind energy potential. The U.S. has the world's largest wind energy potential.



EXCITING EARTH

The greenhouse effect makes the temperature of the Earth rise. Here's an experiment that shows how it works.

WHAT YOU NEED

- Egg carton or a bowl
- Two thermometers
- Plastic wrap
- Damp earth



WHAT YOU DO

1. Put some damp soil in a bowl or lid of an egg carton
2. Lay a thermometer on the soil and then cover it with more soil.
3. Cover the container with plastic wrap. Make sure it's airtight. Put it in a sunny place.
4. Leave the other thermometer near, but outside, the container.
5. After two hours, check the two thermometers and note whether there is a difference between the two temperatures.

WHY IT WORKS

Light is a form of energy that can pass through the plastic wrap easily. When it enters your greenhouse and bounces off the soil, some of that light is changed into another form of energy: heat. But heat does not move through the plastic as easily as light does, and some of it gets trapped in the greenhouse. So the thermometer outside the container

should be cooler than the one inside.

This is also how sunlight warms our planet. Light from the sun reflects off the Earth, changes into heat and gets trapped by gases, such as carbon dioxide, in our atmosphere. Unfortunately, factories and automobiles are greatly increasing the amount of carbon dioxide in the air. It's causing more and more heat to be trapped in the Earth's atmosphere. This is called the *greenhouse effect*.

WHAT'S SMOG GOT TO DO WITH IT?

"Smog" is a combination of two words—smoke and fog. This experiment will show you what causes this kind of air pollution.

WHAT YOU NEED

- A large, wide-mouthed glass jar
- Some scrap paper
- Matches, and an adult to help you light them
- Aluminum foil
- Scissors
- Some ice cubes
- Salt

WHAT YOU DO

1. Fill the jar with water, then pour it out. (The insides of the jar need to be damp.)
2. Cut out a circle of foil about a half inch bigger than the mouth of the jar.
3. Place as many ice cubes as can fit in the center of the foil circle. Then sprinkle some salt over them.
4. Have an adult light the scrap of paper and drop it into the jar. Then cover the jar with the foil. Press the sides of the foil down around the sides of the jar.



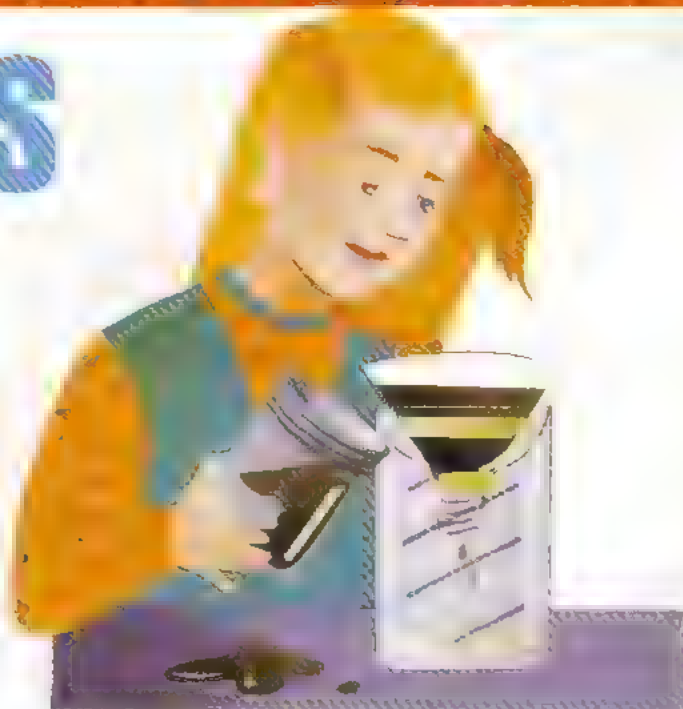
EXPERIMENTS

5. Let the paper burn. It will go out quickly and begin to smoulder. Be careful not to inhale the fumes.

WHY IT WORKS

You should be able to see "gusts" of smoke climbing up and then falling down to form a thicker, dirtier gray cloud. The hot smoke rises until it reaches the ice-cooled foil. Then, the change in temperature causes the smoke to condense and fall back down, taking some of the moisture in the air along with it. This mixture of smoke and moisture hangs in the jar as a soupy "smog."

This is similar to what happens in many cities. Pollution that rises from cars and factories falls back down when it hits the higher cooler air.



PURE AND SIMPLE This experiment will help you understand one of the first stages of how water is made pure in a water treatment plant.

WHAT YOU NEED

- Muddy water
- A plastic soda bottle
- Coffee filter paper
- Some sand
- Some charcoal (crushed to a powder)

WHAT YOU DO

1. Cut three or four inches off the top of the plastic bottle.
2. Use the piece you cut off like a funnel and place it upside down on top of the bottle. Lay a coffee filter in the funnel and pour in about one inch of sand.
3. Add a layer of crushed charcoal on top of the sand and add another layer of sand. Pour some muddy water through the filter. You'll see the water look cleaner as it flows into the bottle.

WHY IT WORKS

The muddy water has small particles of dirt in it. When you pour it through the layers of sand, charcoal and paper, the water starts to get cleaner. The fine particles in the powdered charcoal trap a lot of the dirt that the large grains of sand let escape.

Don't drink this water. It may have harmful germs in it. In a water treatment plant, the filtering process is longer and a chemical is added to kill many of the germs.



POLLUTERS BEWARE!

TO WIN, YOU HAVE TO STOP YOUR OPPONENT FROM POLLUTING THE ENVIRONMENT.

WHAT YOU'LL NEED:

- One die
- Two coins to use as markers.

HOW TO SET UP:

- Cut out the cards on the opposite page. Arrange them in order (as they are now) so they form one complete, unpolluted map.
- Choose one player to move first. He or she is called the "Polluter." The other player is the "Protector."
- The Protector places his or her marker on any card. Then, the Polluter places his or her marker on a card.

HOW TO PLAY:

- The Polluter moves first. He or she rolls the die and may move on the map any number of spaces up to the number on the die. The Polluter may move up, down and sideways, but may *not* move diagonally.

- Flip over every card that the Polluter passes over or lands on. Those spaces have been "spoiled."

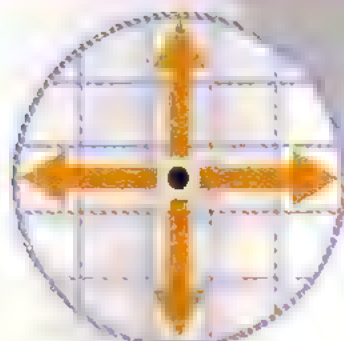
- Then, the Protector rolls the die and moves. If it is an odd number, he or she may only move one space. If it is an even number, he or she may move up to two spaces. The Protector may move sideways, up, down *and* diagonally.

- If the Protector passes over or lands on any spoiled spaces, he or she can clean them up by flipping them back over.

- Play ends when either player lands on a square occupied by his or her opponent.

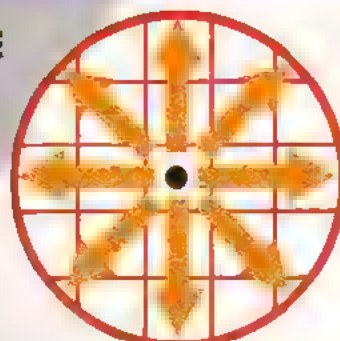
HOW TO WIN:

The game is played in two rounds, so each player gets a chance to be a Polluter and a Protector. At the end of each round, count up the total number of spaces that have been spoiled. The Protector who lets his or her opponent spoil the fewest squares wins the game!



POLLUTER
1 TO 6 SPACES

**A SQUARE ONE
BOARD GAME
FOR TWO
PLAYERS**



PROTECTOR
1 TO 2 SPACES





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THE TIME TEAM

The Last Laugh

By Curtis Slepian

It was spaghetti and meatball day at the Albert Einstein High School cafeteria. Jenny Lopez was halfway through her lunch when Sean Nolan slid into a seat across from her.

"Can I have a sip of your milk?" he asked.

"Can't you just buy your own? Here," she said angrily, passing him the pint carton. Sean was such a pain.

Jenny turned to chat with her friend Carol and a minute later, Sean returned the milk to her. "Do you want any more of my lunch?" said Jenny sarcastically, lifting the carton to her lips. As she drank, her shirt began to feel wet. She looked down and saw milk dribbling out of the carton and onto her shirt: Sean had punched a hole through the top of her milk carton!

Everyone at the table was laughing, even Carol. Sean was howling the loudest.

"I'll get you for this, Sean," said Jenny furiously. This made everyone laugh even louder. Jenny felt her face grow hot from embarrassment. She hated looking foolish.

"What's going on here?" It was Mr. Krupkie, the lunch room monitor.

After Jenny explained, Mr. Krupkie grabbed Sean by his arm.

As he was being led away, Sean said to Jenny, "You've got no sense of humor."

That evening, while Jenny was reading in her room, the doorbell rang. It was Sean. Jenny's mother let him in.

Crying Over Spilt Milk

Up in Jenny's room, Sean said, "Because you can't take a joke, the principal gave me detention."

"I'm busy, why don't you leave?"

Sean took Jenny's tachyon machine off her bureau, along with two universal translators. The time-traveling machine was Jenny's invention. The translators came from a trip the teens took to the 21st century. "Okay, I'll leave," said Sean with a mean chuckle. "And you're going with me." He pressed the button on the tachyon machine, and the two teens disappeared from Jenny's house. In fact, they vanished from the 20th century.

A nanosecond later, Sean and Jenny found themselves in front of Notre Dame cathedral.

"We're in Paris!" exclaimed Jenny. "I've always wanted to go there."

Sean looked around and said, "Where's the Eiffel Tower?"

This wasn't the Paris they had seen in photos—it was much smaller, and was surrounded by a large stone wall. Beyond the wall sat castles on green hills. Sailboats floated down the Seine River. The streets were filled not with cars, but with riders on horseback. And strangest of all, there wasn't a single TV antenna on any roof!

"Get a load of this sharp dude," said Sean.

Approaching the teens was a man dressed in silk and velvet, with a feathered hat, and a dagger hanging from his belt. Sean stopped him and asked what year it was. The man seemed puzzled by the question. Of course! Sean wasn't wearing the universal translator. He popped it in his ear and asked the question again, and this time it



came out in French. The man said, "I expect a foolish question from a person dressed so foolishly. This is the year 1564. As a matter of fact, today is New Year's Day!"

As the man continued on his way, Jenny observed, "Nice weather for January 1st."

"If I remember history class, nothing much happened in 1564," said Sean.

"And nothing much happens in your brain, either," shot back Jenny. "You've taken me into the past against my will—that's, that's timenapping!"

"Oh, lighten up, Jenny," sighed Sean. Then he spotted some kids carrying books. "Let's hang out with them."

Sean was so unpredictable, he made Jenny nervous. She said, "Just don't forget that as a tourist in France, it's important to be polite."

One of the school kids came up to her: "I'm a poor student at the University of Paris. Please give me money to help pay for my logic and astrology lessons."

"I'm very sorry," Jenny said. "I don't have any money. But happy New Year anyway."

The students stared at Jenny, exchanged sly looks with each other and slowly walked around the corner. ☞





"Excuse me, do I have bad breath or something?" said Jenny. Sean shrugged. The teens decided to sightsee, walking up a narrow, twisting street. Halfway up, Sean stopped outside a pastry shop window. "Boy, that looks delicious."

"We don't have any French money," said Jenny. "So dream on."

As the kids turned away, Jenny noticed a large silver coin on the sidewalk. "That solves our problem," she said, reaching for the coin. Suddenly, the coin jerked away from her hand. Jenny scratched her head, then reached down again. Again it jumped away from her, around the corner of a building.

French Fried

Jenny ran after the coin, Sean trailing her. As they turned the corner, they ran into the students, who were roaring with laughter. One of them held a string that was attached to the coin—he had been moving it all along. "How foolish you looked chasing the money," he guffawed.

Jenny spun around and strode in the other direction, her face bright red. "And I was so polite to them," she said. Sean tried not to crack up. "That was pretty funny, you have to admit it."

"No, I don't," Jenny snapped. She wanted to get far away from those laughing idiots, so she

marched past stone and wood houses. Soon the teens entered a section of Paris filled with tradesmen working in open shops: shoemakers, weavers, lantern-makers, embroiderers, goldsmiths. Sean saw a store that sold nothing but eyeglasses. "Dig these old-fashioned glasses!"

"Come in," waved the shopkeeper. "Look at my wares—or better still, look through them."

"Do you sell contact lenses?" asked Sean with a straight face. The shopkeeper looked bewildered. Sean was always goofing on people, thought Jenny. "Try not to act stupid for once," she hissed at him. To the shopkeeper she said politely, "Thanks, we'll have a look, sir. And by the way, happy New Year to you."

The shopkeeper smiled, then went into the back of the store and returned with brass-framed spectacles. He handed them to Jenny and said, "For wishing me a happy New Year, you may try on these special eyeglasses guaranteed to improve anyone's vision."

"It pays to be polite," said Jenny to Sean. She put on the glasses, squinted and said in a puzzled voice, "These lenses are plain glass." When she moved the eyeglasses away from her face, Sean started giggling.

"What's so funny?" asked Jenny.

Then Jenny saw herself in a mirror hanging on the shop wall: She had two black eyes! The frames of the eyeglasses had been coated in coal dust.

"That's a rotten trick," she yelled at the shopkeeper, who chuckled, "And a happy New Year to you, miss."

Sean was laughing so hard, he couldn't speak.

Jenny, on the other hand, was furious. "Why are people playing tricks on me and not on you?" she said to Sean. She was so angry she threw the spectacles to the floor, breaking them.

"You'll pay for that," yelled the shopkeeper, grabbing at Jenny.

"Run for it!" screamed Sean.

The teens tore out of the shop and through the streets, the shopkeeper chasing them. "You'd better learn to take a joke or you'll really get us in trouble," said Sean, as they pushed past jugglers, monks, beggars and food vendors. Dashing around a corner, they ran right into a group of noblemen mounted on horseback on their way to a hunt.

"Out of our way, peasants," said one of the bearded noblemen. He wore short pants and stockings, and a sword dangled from his side.

"Don't call me a peasant, you big dufus," shouted back Sean. Two of the noblemen dropped

off their horses and drew their swords.

"I'll handle this," said Jenny to Sean. She said to the noblemen, "My friend was just joking. I hope you all have a happy and safe New Year."

Hearing this, the two noblemen began whispering to each other. The teens saw one of them reach inside a leather pouch hooked on the horse's saddle and pull out a dagger. "Here's a happy New Year to you." In a flash he thrust the knife at Jenny's side. Sean saw the dagger disappear against her side. He screamed. Jenny screamed even louder. And the two men screamed louder still — with laughter. The nobleman pulled out the dagger, but there was no blood, no wound!

The nobleman held up the dagger and pushed against the blade — it slid into the handle. It was a fake wooden dagger, the teens realized, like the kind used in movies.

Jenny snatched the dagger and broke it in half. This time the nobleman reached for a real dagger. Before he could use it, he was surrounded by some workers who had watched the whole scene. "Leave the girl alone," one of them said, raising a large stick. The noblemen rode off, promising to return.

"Boy," said Sean, "there are some heavy-duty pranksters in the 16th century."

"Yeah," said Jenny, "but why are they all pulling pranks on me? I'm always so polite."

Jenny's rescuers led the teens into a nearby tavern. Jenny thanked them, adding, "And have a happy New Year."

The tavern owner said, "Young lady, why don't you sit down on those pillows?"

"See, Sean, they appreciate politeness here," said Jenny.

Jenny sat down on the pillows. Immediately, from under her came a deep, impolite noise, like a tuba blowing. While the men bellowed laughter, Jenny's face turned tomato red. She reached under the pillow and pulled out a small pig's bladder. It was a 16th-century whoopie cushion!

"Have some water on the house," said the owner, filling a glass part way.

"Thank you," said Jenny trying to keep her temper.

Fool's Paradise

Jenny drank deeply. And wetly. She looked down and saw that water was pouring out of a small hole drilled in the top of the glass. "Oh no, not again!"

Jenny couldn't help it. She started laughing. And she didn't mind that everyone else was laugh-

ing — it *was* pretty funny.

"You're a good sport," chuckled the tavern owner.

"But why did you play these tricks on me?" asked Jenny.

The owner explained. "In France, New Year's Day used to fall on April 1st. This year our king, Charles IX, changed the calendar. He ordered that New Year's Day be on January 1st. But there are some people, like you, who don't like the change. They still celebrate New Year's on April 1st, which is today's date. We call these people April Fools. And we play tricks on them."

"So that's how April Fool's Day started," marveled Sean. "And since you wished everyone a happy New Year, they thought you were April Foolish."

"I guess that makes me one of the first April Fools in history!" laughed Jenny.

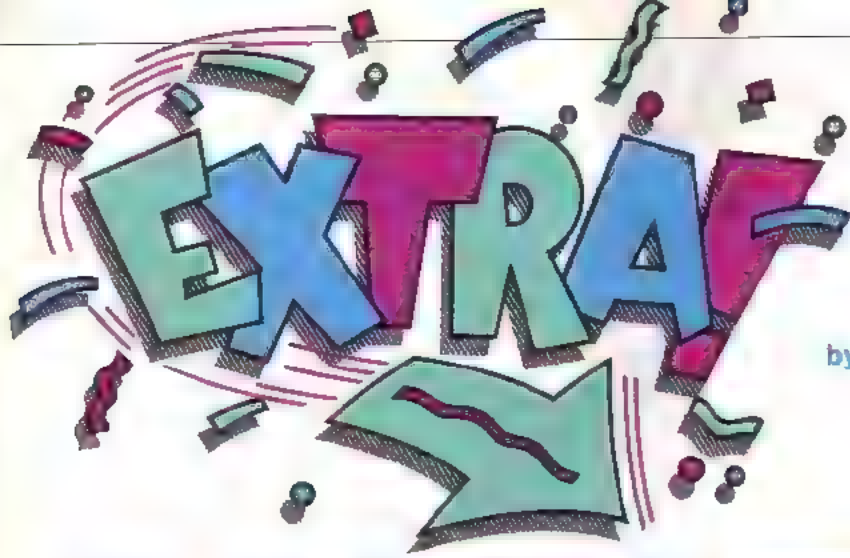
After they left the tavern, Sean and Jenny decided to go home — before they ran into the angry shopkeeper or the noblemen. Jenny hit the button on the tachyon machine. And as usual, they were transported to Jenny's room the moment after they had left it.

The next day, in the school cafeteria, Jenny came up to Sean and held out her hand. "Just to show you I have no hard feelings about the milk," she said.

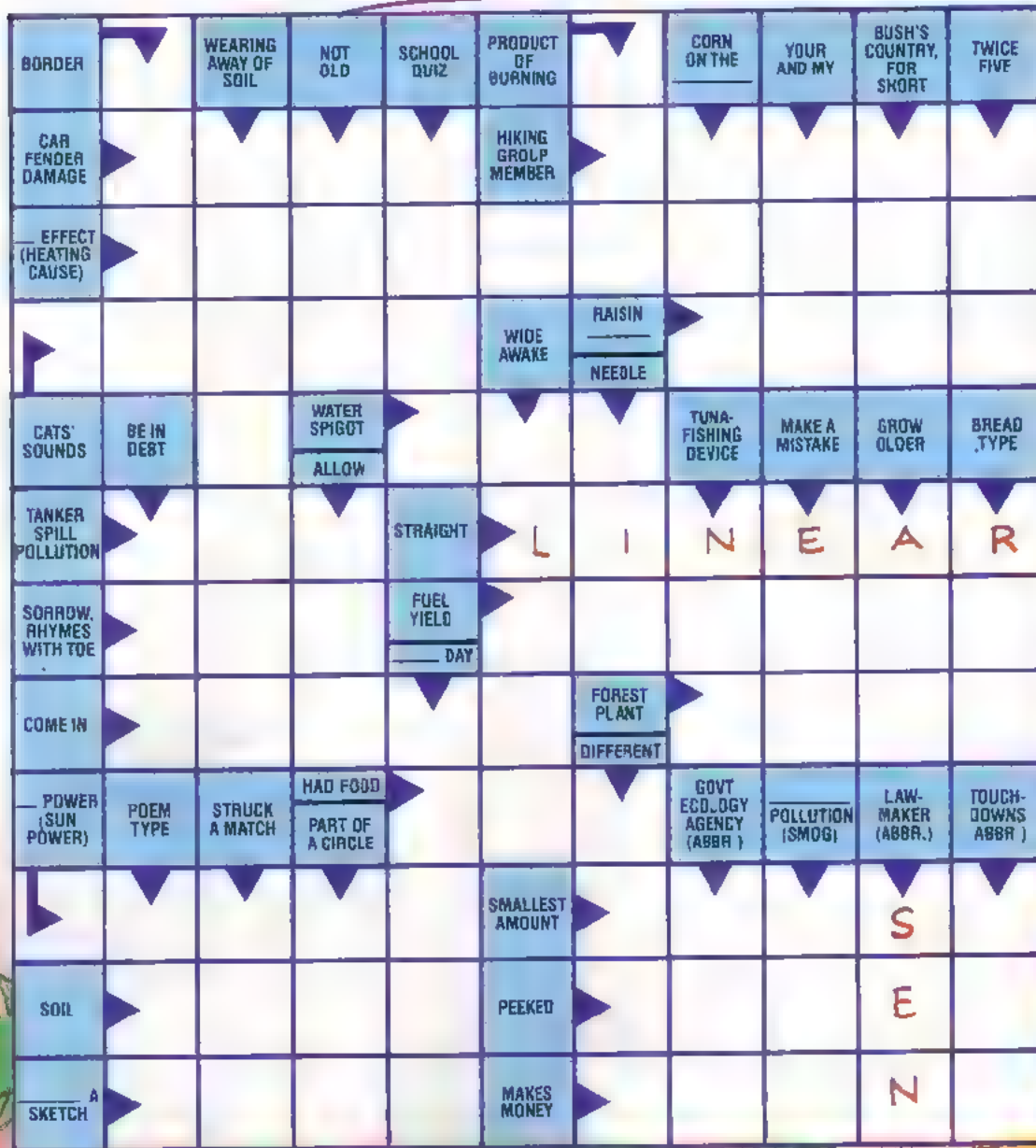
Sean took her hand to shake it — and got a shock!

Jenny was holding a joy buzzer. ♦





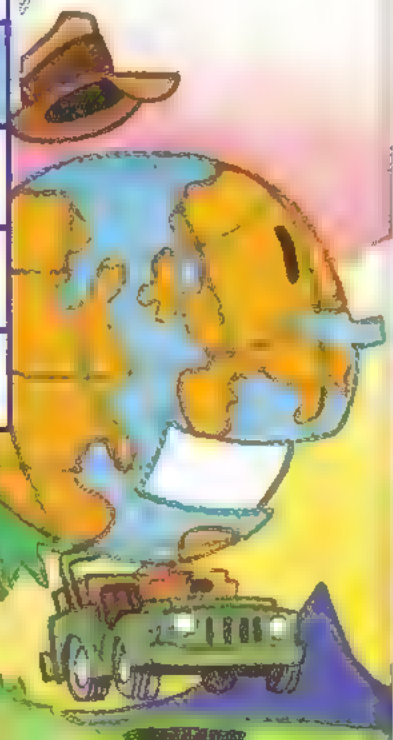
by Mike Shenk and Russell Ginns



BOXED IN

Here's a special crossword puzzle for you to solve. Read the clues in the shaded boxes and fill in the answers in the direction of the arrows. Along the way, you'll find many words that you have learned in this special issue about the environment.

ILLUSTRATION BY JANE W. S.



CLOSE TO THE EDGE AN ENDANGERED ANIMALS CONTEST

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Second Prize: A nifty CONTACT T-shirt

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21 different types of animals are hidden in this word search. All of them have at least one species that is in danger of becoming extinct. Words go up, down, across, backwards and diagonally. Use our list to find them all.

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Wait! Here's some good news! The leftover letters will spell two animals that have been brought back from the edge of extinction. Write down the names of those animals on a separate piece of paper and mail it to:

Endangered Animals Contest
3-2-1 CONTACT Magazine
P.O. Box 40
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We'll randomly draw winners from all of the correct entries. The first-prize winner will get a deluxe animal encyclopedia. Five second-prize winners will win their very own CONTACT T-shirts.

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WHALE
CAMEL

C	O	R	A	N	G	U	T	A	N	B	P
R	B	A	R	H	I	N	O	L	N	U	A
A	E	E	T	A	N	A	M	S	I	T	N
Y	P	C	G	H	D	D	E	K	R	T	D
F	A	A	A	O	A	U	A	I	A	E	A
I	R	I	G	M	R	T	C	N	M	R	L
S	R	M	E	W	E	I	E	K	A	F	T
H	O	A	B	U	H	L	L	E	T	L	I
K	T	N	O	O	B	A	B	L	H	Y	G
I	T	N	A	H	P	E	L	E	A	C	E
T	T	O	R	T	O	I	S	E	F	F	R
E	A	L	L	L	I	B	N	R	O	H	O



BASIC TRAINING

Programs For Your Computer

POWER MANAGER!

For Apple II, IBM and
Commodore Computers

With this program, you are the manager of a power plant. Your high-tech energy center consists of four types of areas:

- 1) Desert 2) Mountain
- 3) Plains 4) Forest

You may place one type of generator in each area. Each generator creates a different power level. The levels are:

Solar = 1 unit
Hydroelectric = 2 units
Wind = 3 units
Alcohol = 4 units

The only problem is, you don't know which generator to place in which area. After each turn, the computer will tell you what your energy level is. Keep trying until you get the exact level the computer asks for.

The program is written for the IBM PC. For APPLE II or COMMODORE computers, leave out the first line.

```

10 RANDOMIZE (TIMER)
20 DIM E(4),T(4),N1$(4),N2$(4)
30 FOR I=1 TO 4: READ N1$(I):
  NEXT I
40 FOR I=1 TO 4: READ N2$(I):
  NEXT I
50 PRINT "GAME LEVEL
  (E=EASY, H=HARD)";
60 INPUT B$
70 IF B$="H" OR B$="h" THEN
  GL=1 ELSE GL=0
80 GOSUB 310
90 TEST=0
100 PRINT "ASSIGN ENERGY
  SOURCES:"
110 FOR I=1 TO 4
120 PRINT "ZONE" I;
130 INPUT "...",E(I)
140 E(I)=INT(E(I))
150 IF E(I)<1 OR E(I)>4 THEN 130
160 IF E(I)=T(I) THEN
  TEST=TEST+E(I)
170 NEXT I
180 PRINT "Your energy rating is:"
  TEST
190 PRINT "Possible energy: "PE
200 IF TEST<PE THEN 90
210 PRINT "The terrains were: "
220 FOR I=1 TO 4
230 PRINT "Zone" I": "N2$(T(I))
240 NEXT
250 PRINT "The energy sources you
  assigned:"
260 FOR I=1 TO 4
270 PRINT "ZONE "I": "N1$(T(I))
280 NEXT
290 PRINT "You win!!"
300 END
310 FOR I=1 TO 4

```

```

320 T(I)=INT (RND(1)*4+1)
330 IF GL=1 THEN 420
340 Z=0
350 FOR J=1 TO (I-1)
360 IF T(I)=T(J) THEN Z=1
370 NEXT J
380 IF Z=0 THEN 420
390 T(I)=T(I)+1
400 IF T(I)>4 THEN T(I)=1
410 GOTO 340
420 NEXT I
430 PE=0: FOR I=1 TO 4
440 PE=PE+T(I)
450 NEXT I
460 RETURN
470 DATA solar, hydroelectric, wind,
  alcohol
480 DATA desert, mountain, plain,
  forest

```

SEND US YOUR PROGRAMS

If you've written a program you'd like us to print, send it in. If we like it, we'll print it and send you \$25. Include a note telling us your name, address, age, T-shirt size and type of computer.

All programs must be your own original work. We cannot return programs. Please do not send discs.

Send your programs to:



Did it

BOXED IN

BORDER	E	WEARING AWAY OF SOIL	NOT OLD	SCHOOL CHIEF	PRODUCT OF BURNING	A	CORN ON THE	YOUR AND MY	BUSH'S COUNTRY FOR SHORT	TWICE FIVE
CAR FENDER DAMAGE	D	E	N	T	HIKING GROUP MEMBER	S	C	O	U	T
EFFECT (HEATING CALORIES)	G	R	E	E	N	H	O	U	S	E
M	E	O	W	S	WIDE AWAKE	RANXIN	B	R	A	N
CAD'S SQUADS	S	BE IN DEBT	WATER SPIGOT	T	A	P	TUNA-FISHING DEVICE	MAKE A MISTAKE	BROW GLIDER	BREAD TYPE
TANKER SPOIL POLLUTION	O	I	L	STRAIGHT	L	I	N	E	A	R
SUPROW RHYMES WITH TUG	W	O	E	FUEL YIELD	E	N	E	R	G	Y
COME IN	E	N	T	E	R	FOREST PLANT	T	R	E	E
POWER (SIN-POWER)	S	POEN TYPE	STRUCK A MATCH	HAD FIDO	A	T	E	GOVT ECOLOGY AGENCY (ABBR.)	POLLUTION (SMOG)	LAW-MAKER (ABBR.)
S	O	L	A	R	SMALLEST AMOUNT	L	E	A	S	T
SOIL	D	I	R	T	PEEKED	S	P	I	E	D
A SKETCH	E	T	C	H	MAKES MONEY	E	A	R	N	S

THANKS

We'd like to thank the teachers and students from the Lime Kiln School in Suffern, NY, for their wonderful suggestions and comments about 3-2-1 CONTACT.

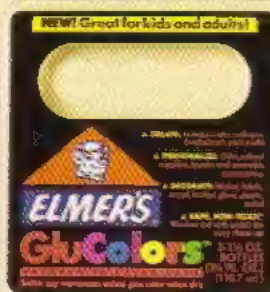
Thanks to our research interns Martha Montes and Allison McMorris for their help during the year.

Thanks to Wendy Williams for her help in creating this special issue.



YOU DON'T HAVE TO COLOR BETWEEN THE LINES.

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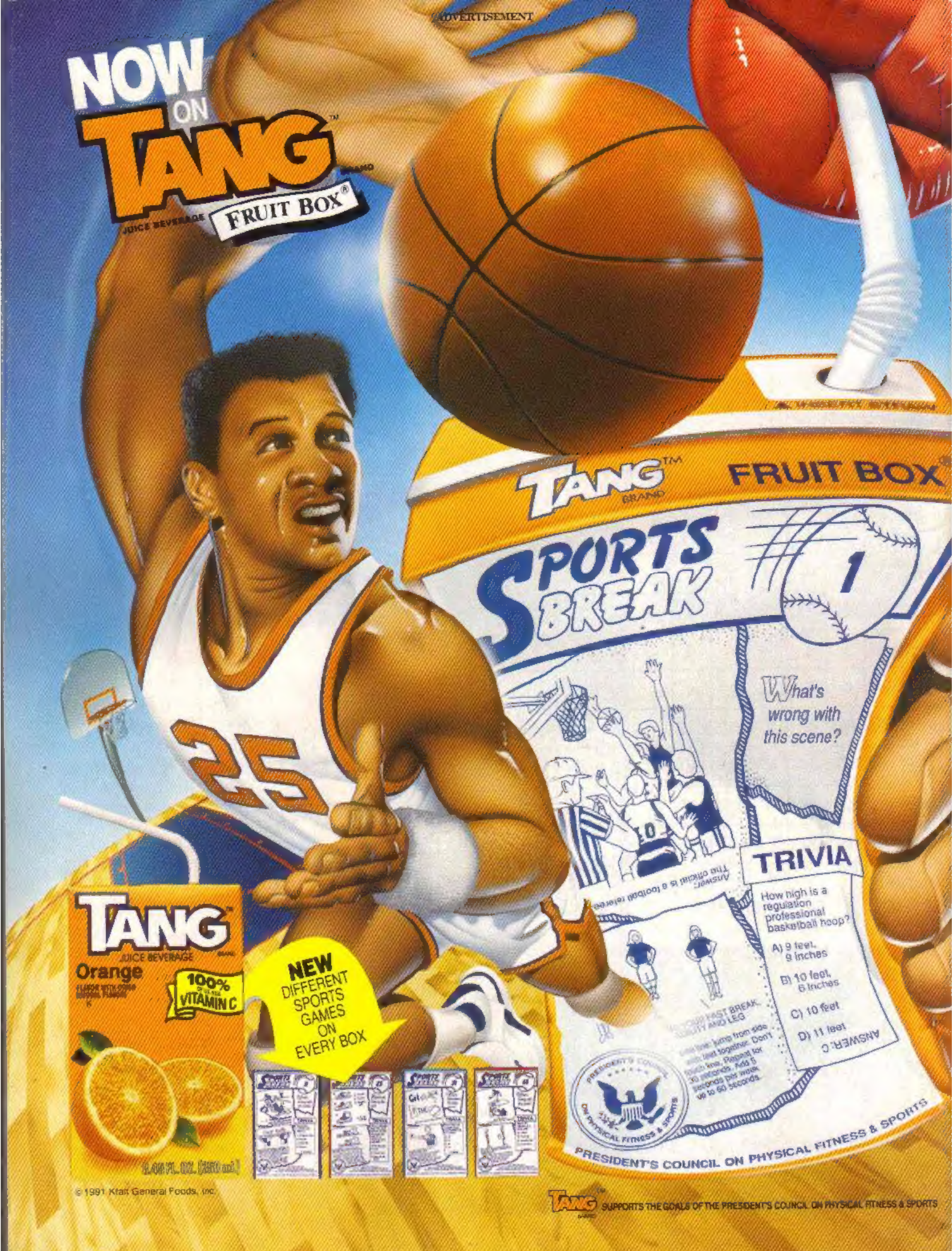
Fasten your seat belt. It's time to blast into color. Six hot, screaming, neon color glues. New Elmer's GluColors. Decorate all kinds of stuff, from notebooks to visors. Or make window stickies and cards and crafts. C'mon, give us a squeeze.

The glue that was meant to be seen!



IF IT'S BORDEN-IT'S GOT TO BE GOOD

NOW ON
TANG
JUICE BEVERAGE
FRUIT BOX



NEW
DIFFERENT
SPORTS
GAMES
ON
EVERY BOX



TANG BRAND **FRUIT BOX**

SPORTS BREAK

1

What's wrong with this scene?

TRIVIA

How high is a regulation professional basketball hoop?

A) 9 feet, 9 inches
B) 10 feet, 6 inches
C) 10 feet
D) 11 feet

ANSWER: C

Answer: The official is a football referee.

FAST BREAK
SQUAT AND LEG

Stand with feet from side to side, knees together. Don't touch knee. Push out for 30 seconds. Add 5 seconds per week, up to 60 seconds.

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